

**Course Objective:**

*To have knowledge on prestressing, design and deflection of prestressed concrete beams.*

**UNIT – I**

**Introduction:** Historic development – General principles of prestressing, pretensioning and post tensioning – Advantages and limitations of prestressed concrete – Materials – High strength concrete and high tensile steel their characteristics.

**UNIT – II**

**Methods Of Prestressing:-** Methods and Systems of Prestressing; Pre-tensioning and post tensioning methods – Analysis of post tensioning - Different systems of prestressing – Loss of prestress in pre-tensioned and posttensioned members due to various causes like elastic shortening of concrete, shrinkage of concrete, creep of concrete, Relaxation of stress in steel and wobble frictional losses.

**UNIT – III**

**Analysis & Design of Sections For Flexure;-** Elastic analysis of concrete beams prestressed with straight, concentric, eccentric, bent and parabolic tendons.Allowable stress, Design criteria as per I.S.Code – Elastic design of simple rectangular and I-section for flexure – Kern – lines, cable profile.

**UNIT – IV**

**Design Of Shear :** Shear and Principal Stresses – Design for Shear in beams – Analysis of stress – General designs considerations.

**UNIT – V**

**Deflections Of Prestressed Concrete Beams:** Importance of control of deflections – factors influencing deflections – short term deflections of uncrackedmembers prediction of long term deflections.

**Course Outcomes:**

*Student shall have knowledge on*

- *Methods of prestressing and able to design various prestressed concreteStructural elements.*
- *Analysis of sections to withstand shear and flexure.*



**TEXT BOOKS:**

1. Prestressed Concrete by N. Krishna Raju; - Tata Mc.Graw Hill Publications.
2. Prestressed Concrete by N.Rajasekharan; - Narosa publications.
3. Prestressed Concrete by Ramamrutham,Dhanpatrai Publications

**REFERENCE:**

1. Design of Prestressed concrete structures (Third Edition) by T.Y. Lin & Ned H.Burns, John Wiley & Sons.
2. Pre stressed concrete by E.G.Nawy Codes/Tables: Codes: BIS code on prestressedconcrete, IS 1343 to be permitted into the examination Hall.

G. R. L.

